Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-82. (Cancelled)

83. (Currently Amended) A system for determining a plurality of emerging patterns within a training data set D containing gene expression data for a plurality of genes derived from a plurality of normal cells and a plurality of diseased cells, wherein said emerging patterns [[can be]] are used to test cells from a test sample for the presence of the disease, the system comprising:

at least one memory, at least one processor and at least one user interface, all of which are connected to one another by at least one bus;

wherein said at least one processor is configured to:

access the gene expression data within the training data set D;

determine a plurality of emerging patterns from the training data set D, wherein each of said emerging patterns comprises at least one condition based on a fixed range of said gene expression data for at least one of said plurality of genes and wherein a plurality of occurrences satisfies said at least one condition for one of said normal and diseased cells, but no occurrence satisfies said at least one condition for the other of said normal and diseased cells;

create 2 lists, wherein:

a 1st list of said 2 lists contains a frequency of occurrence, $f_1(m)$, of each emerging pattern $EP_1(m)$ from said plurality of emerging patterns that has a non-zero occurrence in data associated with said normal cells; and

a 2nd list of said 2 lists contains a frequency of occurrence, $f_2(m)$, of each emerging pattern $EP_2(m)$ from said plurality of emerging patterns that has a non-zero occurrence

in data associated with said diseased cells; [[and]]

receive data from a plurality of genes in said test sample to produce a test data set, said plurality of genes comprising at least a portion of the genes identified in said plurality of emerging patterns for said training data set D;

determine another plurality of emerging patterns from the test data set;

using a fixed number, *k*, of emerging patterns extracted from said training data, wherein *k* is substantially less than a total number of emerging patterns in the plurality of emerging patterns, calculate 2 scores, wherein a 1st score corresponding to the data associated with the normal cells is derived from the frequencies of *k* emerging patterns in said 1st list that also occur in said test data; and a 2nd score corresponding to the data associated with the diseased cells is derived from the frequencies of *k* emerging patterns in said 2nd list that also occur in said test data; and

determine whether said test cells are normal or diseased using said two scores. ~~wherein said 2 lists each provide a plurality of emerging patterns that can be used as a diagnostic tool to determine whether the cells from the test sample are normal or diseased.~~

84. (Previously Presented) The system of claim 83, wherein at least one of said emerging patterns comprises at least three conditions for each of said normal and diseased cells.

85. (Cancelled)

86. (Currently Amended) The system of claim [[85]] 83, wherein, prior to determining said plurality of emerging patterns, said processor applies an entropy based discretization method to said training data set, to generate a cut point that defines said fixed range, such that said normal data falls within said fixed range on one side of said cut point, and said diseased data falls on an opposite side of said cut point.

87. (Previously Presented) The system of claim 86, wherein, after applying said discretization method, said processor further applies a method of correlation based feature selection to said training data set.

88. (Previously Presented) The system of claim 86, wherein, after applying said discretization method, said processor further applies a chi-squared method to said training data set.

89. (Previously Presented) The system of claim 86, wherein said emerging patterns are jumping emerging patterns.

90. (Currently Amended) A system for determining a plurality of emerging patterns within [[In]] a training data set D containing mushroom characteristic data for a plurality of mushrooms derived from a plurality of edible mushrooms and a plurality of poisonous mushrooms, ~~a method for determining a plurality of emerging patterns within the mushroom characteristic data,~~ wherein said emerging patterns [[can be]] are used to test mushrooms from a test sample to determine if said test mushrooms are edible, the ~~method~~ system comprising ~~the steps of~~:

at least one memory, at least one processor and at least one user interface, all of which are connected to one another by at least one bus;

wherein said at least one processor is configured to:

~~determining~~ determine a plurality of emerging patterns from the training data set D, wherein each of said emerging patterns comprises at least one condition based on a particular characteristic of said mushroom characteristic data for at least one of said plurality of mushrooms and wherein a plurality of occurrences satisfies said at least one condition for one of said edible and poisonous mushrooms, but no occurrence satisfies said at least one condition for the other of said edible and poisonous mushrooms;

~~creating~~ create 2 lists, wherein: a 1st list of said 2 lists contains a frequency of

occurrence, $f_1(m)$, of each emerging pattern $EP_1(m)$ from said plurality of emerging patterns that has a non-zero occurrence in data associated with said edible mushrooms; and a 2nd list of said 2 lists contains a frequency of occurrence, $f_2(m)$, of each emerging pattern $EP_2(m)$ from said plurality of emerging patterns that has a non-zero occurrence in data associated with said poisonous mushrooms;

receive data from a plurality of mushrooms in said test sample to produce a test data set, said plurality of mushrooms comprising at least a portion of the mushrooms identified in said plurality of emerging patterns for said training data set D;

determine a plurality of emerging patterns from the test data set;

using a fixed number, *k*, of emerging patterns extracted from said training data, wherein *k* is substantially less than a total number of emerging patterns in the plurality of emerging patterns, calculate 2 scores, a 1st score corresponding to the data associated with the edible mushrooms is derived from the frequencies of *k* emerging patterns in said 1st list that also occur in said test data; and a 2nd score corresponding to the data associated with the poisonous mushrooms is derived from the frequencies of *k* emerging patterns in said 2nd list that also occur in said test data; and

determine whether said test mushrooms are edible or poisonous using said two scores.

~~wherein said 2 lists each provide a plurality of emerging patterns that can be used to determine whether the mushrooms from the test sample are edible or poisonous~~.

91. (Currently Amended) The ~~method~~ system of claim 90, wherein at least one of said emerging patterns comprises at least three conditions for each of said edible and poisonous mushrooms.

92. (Canceled)

93. (Currently Amended) The ~~method~~ system of claim [[92]] 91, ~~additionally comprising,~~ wherein, prior to [[said]] determining [[step]] said plurality of emerging patterns, ~~a step for~~ said processor ~~applying~~ applies an entropy based discretization method to said training data set, to generate a cut point that defines said particular characteristic, such that said edible mushroom data falls within said fixed range on one side of said cut point, and said poisonous mushroom data falls on an opposite side of said cut point.

94. (Currently Amended) The ~~method~~ system of claim 93, wherein, after applying said discretization method, said processor further applies a method of correlation based feature selection to said training data set. ~~additionally comprising applying a method of correlation based feature selection to said training data set, after said discretizing. method of claim 93, additionally comprising applying a chi-squared method to said training data set, after said discretizing.~~

95. (Currently Amended) The ~~method~~ system of claim 93, wherein, after applying said discretization method, said processor further applies a chi-squared method to said training data set. ~~additionally comprising applying a chi-squared method to said training data set, after said discretizing.~~

96. (Currently Amended) The ~~method~~ system of claim 93, wherein said emerging patterns are jumping emerging patterns.

97. (New) The system of claim 83, wherein said processor determines whether said test cells are normal or diseased by selecting the highest of said two scores.

98. (New) The system of claim 83, wherein each of the 1st and 2nd lists has a length l_i, and k is a fixed percentage of the smallest l_i.

99. (New) The system of claim 98, wherein said fixed percentage is from about 1% to about 5% and k is rounded to a nearest integer value.

100. (New) The system of claim 83, wherein each of the 1st and 2nd lists has a length l_i, and k is a fixed percentage of $\sum_{i=1}^{2} l_i$.

101. (New) The system of claim 100, wherein said fixed percentage is from about 1% to about 5% and k is rounded to a nearest integer value.

102. (New) The system of claim 83, wherein each of the 1st and 2nd lists has a length l_i, and k is a fixed percentage of any l_i.

103. (New) The system of claim 102, wherein said fixed percentage is from about 1% to about 5% and k is rounded to a nearest integer value.

104. (New) The system of claim 90, wherein said processor determines whether said test cells are normal or diseased by selecting the highest of said two scores.

105. (Ne w) The system of claim 90, wherein each of the 1st and 2nd lists has a length l_i, and k is a fixed percentage of the smallest l_i.

106. (New) The system of claim 105, wherein said fixed percentage is from about 1% to about 5% and k is rounded to a nearest integer value.

107. (New) The system of claim 90, wherein each of the 1st and 2nd lists has a length l_i, and k is a fixed percentage of $\sum_{i=1}^{2} l_i$.

108. (New) The system of claim 107, wherein said fixed percentage is from about 1% to about 5% and k is rounded to a nearest integer value.

109. (New) The system of claim 90, wherein each of the 1st and 2nd lists has a length l_i, and k is a fixed percentage of any l_i.

110. (New) The system of claim 109, wherein said fixed percentage is from about 1% to about 5% and k is rounded to a nearest integer value.